Claims

1. A solid-state laser having an active medium for generating a laser beam (L), which comprises a plurality of crystal wafers (2; 2a-h) which are arranged in a resonator (8) and are optically coupled to one another and form a common beam path for the laser beam (L), and having a pumping light source (10; 10, 10b) for generating a pumping light beam (P; Pa, Pb) whose optical axis intersects the flat sides (20, 24) of a plurality of crystal wafers (2a-2h) that are optically arranged one after the other.

2. The solid-state laser, in which the laser beam (L) and the pumping light beam (P; Pa, Pb) propagate in the same plane.

3. The solid-state laser as claimed in claim 2, in which the laser beam (L) and the pumping light beam (P; Pa, Pb) run collinearly to each other.

4. The solid-state laser as claimed in claim 2, in which the optical axis of the pumping light beam (P) runs in an inclined manner to the optical axis of the laser beam (L).

5. The solid-state laser as claimed in one of the preceding claims, in which a respective one of the flat sides (20) of the crystal wafers (2; 2a-h) is assigned a mirror surface (22) which reflects the pumping light beam (P; Pa, Pb) and the laser beam (L) back into the crystal wafer (2; 2a-h).

6. The solid-state laser as claimed in claim 5, in which the crystal wafers (2; 2c-h) are arranged in such a way as to produce a folded beam path for the laser beam (L).

7. The solid-state laser as claimed in one of the preceding claims, in which the crystal wafers (2; 2a-2h) which are optically arranged one after the other in the propagation direction of the pumping light beam (P; Pa, Pb) essentially absorb the same pumping light power.

8. The solid-state laser as claimed in claim 7, in which, in order to equalize the absorbed pumping light power, the thickness (d) of the crystal wafers (2; 2a-2h) is different one from the other.

9. The solid-state laser as claimed in claim 7 or 8, in which, in order to equalize the absorbed pumping light power, the chemical composition of the crystal wafers (2; 2a-2h) is different one from the other.

10. The solid-state laser as claimed in one of the preceding claims, in which at least one imaging element (30,32;40;50;50a-3;64) for focusing the pumping light beam (P;Pa,Pb) emerging from a crystal wafer (2;2a-h) onto the optically downstream crystal wafer is arranged within the resonator (8).

11. The solid-state laser as claimed in claim 10, in which the imaging element (30,32,40,64) essentially influences only the beam path of the pumping light beam (P;Pa,Pb).

12. The solid-state laser as claimed in one of the preceding claims, in which the optical axis of the pumping light beam (P;Pa,Pb) and the optical axis of the laser beam (L) are approximately collinear to each other.

13. The solid-state laser as claimed in claim 12, in which a lens (30,32) with a central opening (34) is provided as imaging element.

14. The solid-state laser as claimed in claim 12, in which a lens (40) is provided as imaging element, the surface (44) of which is curved only in an annular region (42).

15. The solid-state laser as claimed in claim 13 or 14, in which a pumping light beam (P) with an annular cross section is coupled into the resonator (8).

16. The solid-state laser as claimed in claim 12, in which a mirror element (50;50a-d) with a plane surface (52) which reflects the laser beam (L) and transmits the pumping light beam (P) in a wavelength-selective manner, and with a reflective concave surface (54) arranged optically downstream thereof.

17. The solid-state laser as claimed in claim 12, in which a mirror element (50;50a-d) is provided as imaging element, having a plane surface (52) being provided with a mirror coating (56) in a central region and having a concave surface (54) arranged optically downstream thereof.

18. The solid-state laser as claimed in claim 10, in which the imaging element (62,63) influences the beam path of the laser beam (L) and the beam path of the pumping light beam (P).

19. The solid-state laser as claimed in claim 18, in which at least one of the resonator mirrors (4,6) is provided with a curved reflective surface, which thereby produces a stable

resonator together with the resonator-internal imaging element (62,63).

20. The solid-state laser as claimed in claims 12 to 19, in which a wavelength-selective resonator mirror (4,6) is provided for coupling the pumping light beam (P;Pa,Pb) into the resonator (8), the resonator mirror being reflective for the laser beam and transmissive for the pumping light beam.

21. The solid-state laser as claimed in one of claims 12 to 19, in which a beam splitter (60) is provided for coupling the pumping light beam (P;Pa,Pb) into the beam path of the laser beam (L).

22. The solid-state laser as claimed in claims 20 or 21, in which a wavelength-selective resonator mirror (6) is provided for coupling out the laser beam (L), the resonator mirror transmitting at least a part of the laser beam (L) and reflecting the pumping light beam (P).

23. The solid-state laser as claimed in claims 9 or 10, in which the optical axis of the pumping light beam (P) runs in an at least partially inclined manner to the optical axis of the laser beam (L) and the imaging elements (64) being arranged outside the volume of the resonator (8) encompassed by the laser (L) for imaging the pumping light beam (P).

24. The solid-state laser as claimed in one of the preceding claims, in which two pumping light beams (Pa,Pb) are coupled into the resonator (8), which propagate in the resonator (8) in opposite directions.